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EXAMINER

MARKS, JACOB B

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/581,869	Applicant(s) NIETSCH ET AL.	
	Examiner JACOB MARKS	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 10, 11 and 13 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 12 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12-12-06</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claims 7, 12, and 14 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim may not depend upon another multiple dependant claim. See MPEP § 608.01(n). Accordingly, claims 9 and 12 have not been further treated on the merits.

2. Claims 8 and 9 are objected to under 37 CFR 1.75(c) as being in improper form because they are dependant upon an improper multiple dependant claim, namely claim 7. See MPEP § 608.01(n). Accordingly, claims 8 and 9 have not been further treated on the merits.

3. Claims 9 and 14 are objected to under 37 CFR 1.75(c) as being in improper form because they are multiple dependant claims which fail to state their dependence in alternative form. See MPEP § 608.01(n). Accordingly claim 14 has not been further treated on the merits.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-5, 7, 10, 11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, unpatentable under 35 U.S.C. 103(a) in view of Kuwabara et al. (JP 2000-067885).

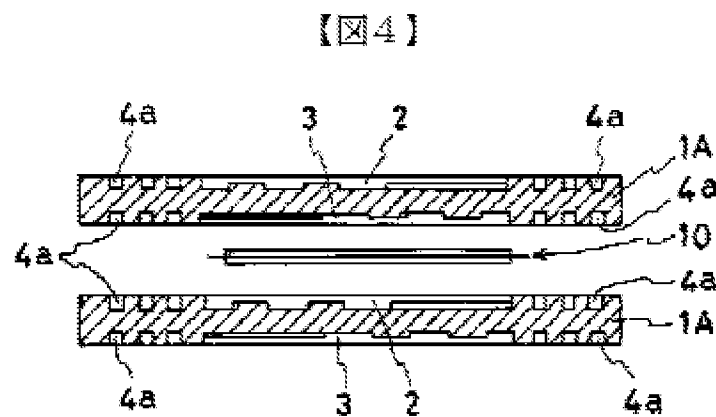
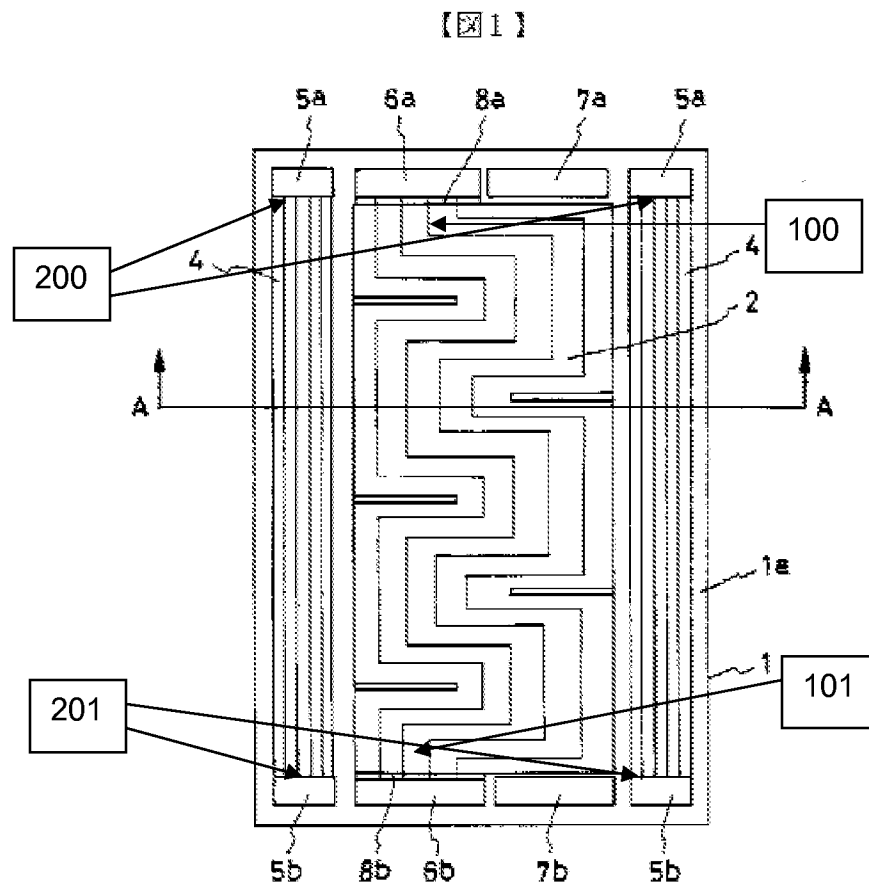
5. Regarding claim 1, Kuwabara et al. teaches a separator plate (1, feed plate), which has an oxidant gas inlet manifold (6a, oxidizer aperture), a fuel gas manifold (7a, fuel aperture), and a cooling-water manifold inlet (5a, cooling water aperture).

Kuwabara further discloses circulating water flow ways (4, refrigeration channel) that is located on the same face as the oxidant gas passage (2, oxidizer circulation channel), each being coplanar with one another (see fig. 1; par. 28-34). In addition, Kuwabara teaches that the oxidant gas passage (2, oxidizer circulation channel) and the fuel gas flow route (3, fuel circulation channel) are located on opposite faces of the separator (see fig. 1). Kuwabara discloses that the circulating water flow ways (4, refrigeration channel) is on both faces of the separator plate (see fig. 4, #4a). The single

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refrigeration channel recited in claim one is interpreted to mean the network of refrigeration channels on both faces of the separator. Kuwabara et al. teaches that the water flow ways (4, refrigeration channel), have a cooling-water flow ways manifold inlet and outlet (5a and 5b, several through passages), wherein the cooling water flow ways are disposed from one face to another and have branches (fig. 1 depicts the cooling water flow ways with branches).

6. Alternatively, it would have been obvious to one of ordinary skill in the art to use a single refrigeration channel instead of the multiple coolant channels shown in fig. 1. Using one coolant channel instead of two would have been obvious to try. MPEP § 2143. One of ordinary skill in the art would recognize that using one coolant channel instead of two would reduce the cost of manufacturing the separator plate. There are only a finite number of coolant channels that can be placed on the separator plate. One of ordinary skill in the art could have pursued removing all but one of the coolant channels with a reasonable expectation that the coolant channel would still function properly to cool the separator plate. Therefore, it would have been obvious to one of ordinary skill in the art to remove all but one of the coolant channels in order to save the cost of manufacturing additional channels.



7. Regarding claim 2, Kuwabara et al. discloses that each inlet and outlet cooling water flow ways (5a and 5b, apertures) have entrances and exits to and from inlet and

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outlet flow ways (5a and 5b) which are positioned on either face of the separator (see fig.1). Therefore, one side of the inlet and outlet water flow ways (5a and 5b) and the corresponding entrances and exits (100 and 101) would inherently be opposite one of the circulating water flow ways (4, 4a, refrigeration channel). Furthermore, circulating water flow ways (4, 4a, refrigeration channel) inherently pass through the thickness of the separator plate at the inlet of the cooling water flow ways (5a, entrance) (see fig. 1, fig. 4).

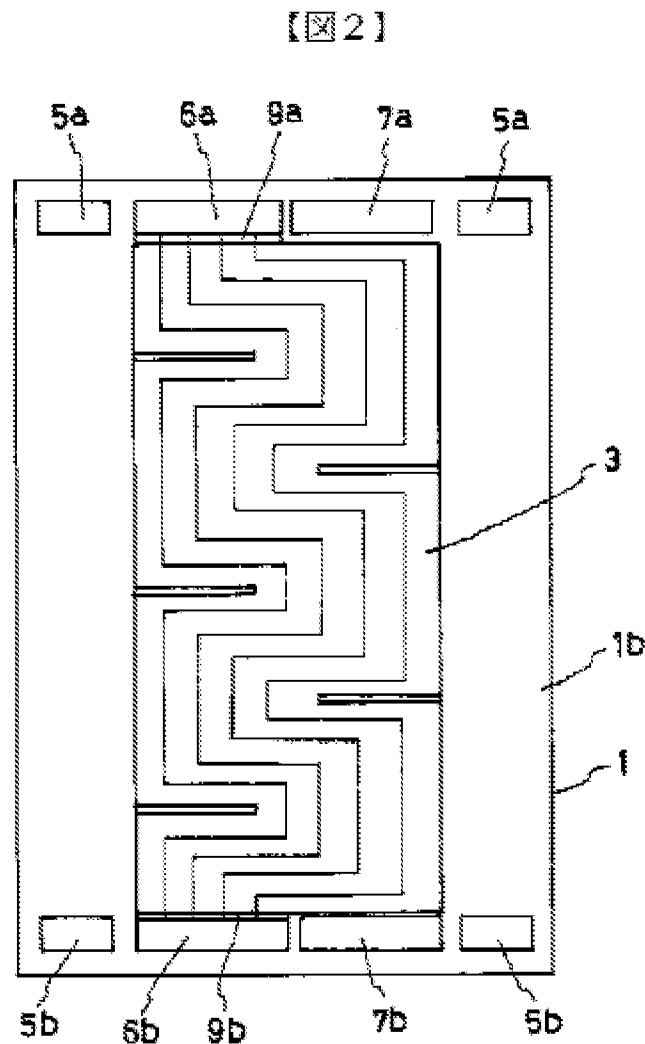
8. Regarding claim 3, Kuwabara discloses that the oxidant gas passage (2, oxidizer circulation channel) and the fuel gas flow route (3, fuel circulation channel) having entrances and exits (100 and 101). Kuwabara also teaches that there are inlets and outlets to the oxidant, fuel, and water flow passages (6a, 7a, and 5a respectively; apertures for feeding). Kuwabara discloses that the entrances and exits (100 and 101) for the fuel gas and oxidant gas passages (2, 3, the different circulation channels) are grouped together at one position on the plate.

9. Regarding claim 4, Kuwabara et al. teaches that the oxidant gas passage, fuel gas flow route, and circulating flow way (2, 3, and 4 respectively, circulation channels and refrigeration channels) follow the same path, i.e. flow in the same direction. The phrase 'the trajectories of the circulation channels and of the refrigeration channel or channels are interleaved', recited in claim 4 is interpreted to mean that the oxidant gas passage, fuel gas flow route, and circulating water flow way (2, 3, and 4 respectively, circulation channels and refrigeration channels) are disposed on either side of the

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separator plate. Accordingly, the circulation channels are interleaved in view of figures 1 and 4.

10. Regarding claim 5, Kuwabara teaches that the oxidant gas passage and fuel gas flow route (2 and 3 respectively, oxidant and fuel circulation channels) are of a zig zag form (see fig. 1 and fig. 2).



11. Regarding claim 7, Kuwabara et al. discloses that the trajectories of the oxidant gas passage, fuel gas flow route, and circulating flow way (2, 3, and 4 respectively,

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circulation channels for oxidant, fuel and coolant) are parallel to one another (see fig. 1) forming a comb-like structure (see fig. 1 and fig. 4).

12. Regarding claim 10, Kuwabara et al. discloses a separator plate (1, feed plate) that is corrugated (see fig. 1, 2, 4) having a fuel gas flow route (3, channels for fuel circulation) on a first face (see fig. 1) and an oxidant gas passage (2, second channels for oxidizer). The phrase, 'interleaved with parallel refrigeration channels on the second face, so that the channels on the first face form separations for the channels of the second face and vice versa' recited in claim 10 is interpreted to mean that there are refrigeration channels that are disposed on either face with separations that allow refrigerant to flow from one face to the other. Kubawa et al. discloses that the cooling water flow ways (4, refrigeration channels) are disposed on either face and have inlet and outlets (5a and 5b, separations) that allow the refrigerant to flow from one face to the other (see fig. 1, 2, and 4). Kuwabara et al. discloses that the fuel gas flow route, the oxidant gas passage, and the cooling water flow ways (3, 2, and 4 respectively, the channels) are all located in the same plane (see fig. 1 and fig. 4), which would thus constitute the separator (1) as being a bipolar plate.

13. Regarding claim 11, Kuwabara et al. discloses that the separator (1, bipolar plate) has a corrugated sheet (see channels in fig. 1 and 4) with inlets and outlets to the oxidant, fuel, and water flow passages (6a, 7a, and 5a respectively; apertures for feeding). Claim 11 recites that the apparatus is possibly surrounded by a frame. Such optional claim language does not place any limitation on claim 11 with respect to that which is made optional, i.e. the frame.

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14. Regarding claim 13, Kuwabara et al. discloses a circulating water flow way (4), wherein the coolant fluid is water (par. 28).

Claim Rejections - 35 USC §103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwabara et al.

15. Regarding claim 6, Kuwabara et al. discloses that the circulation water flow ways (4, refrigeration channels) have branches (see fig. 1) connected to entrances and exits (200 and 201). Kuwabara et al. does not teach that entrances and exits (200 and 201) are spaced over most of the length of the plate. However, changing the relative length of the entrances and exits of the coolant channels would be obvious to try. See, MPEP § 2143. One of ordinary skill in the art would be motivated to increase the length of the entrances to the coolant channels in order to increase the rate of cooling the separator plate. There are a finite number of ways to size the length of the entrances and exits of the coolant channel relative to the size of the plate. Furthermore, one of ordinary skill in the art could have increased the size of the entrances and exits relative to the separator plate with a reasonable expectation of success. Therefore, it would have been obvious to one of ordinary skill in the art to make the length of the entrances and exits to the

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coolant channels spaced over most the length of the plate in order to increase the rate of cooling in the plate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACOB MARKS whose telephone number is (571)270-7873. The examiner can normally be reached on Monday through Friday 7:30-5:00 alt Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacob Marks/

/PATRICK RYAN/

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Supervisory Patent Examiner, Art Unit 1795